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(Australian Petty Patent)

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PARTICLE SCREENING SYSTEM
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- (71) Applicant(s)
USF JOHNSON SCREENS PTY LTD
- (72) Inventor(s)
TERRY ASKEW
- (74) Attorney or Agent
F B RICE & CO, 605 Darling Street, BALMAIN NSW 2041
- (56) Prior Art Documents
WO 89/08509
US 4661245
US 4960510
- (57) Claim

1. A screen panel module for a screening apparatus, the screen panel module being characterised in that it includes two side portions which extend longitudinally of the module, each side portion having

- (a) a longitudinally extending recess,
- (b) a longitudinally extending reinforcing member located inwardly of the recess,
- (c) a longitudinally extending skirt defining an outer edge of the recess, and

(d) a longitudinally extending groove projecting from the recess in a direction normal to the recess,

each side portion being arranged to support the module on a supporting member, the recess and groove of each side portion defining a cavity for clipping engagement with a protrusion of the supporting member, when installed in a screening assembly, to facilitate the retention of the module in position with the two side portions supported on and secured to respective supporting members

AUSTRALIA

Patents Act 1990

USF JOHNSON SCREENS PTY LTD

ORIGINAL

**COMPLETE SPECIFICATION
DIVISIONAL PETTY
PATENT**

Invention Title:

Particle screening system

The following statement is a full description of this invention including the best method of performing it known to us:-

Particle screening system

Introduction

The present invention relates to industrial screens and more particularly to a screen module, a plurality of which are retained by a supporting structure.

5 Background to the Invention.

Currently available screen panels are generally large, heavy and cumbersome requiring considerable time and trouble to dismantle from a supporting structure.

10 Prior art modular screening systems have also been prone to failure of the module clipping arrangement and this problem has generally been addressed by building heavier and more bulky clips which reduce available open area in the screens.

Summary of the Invention

According to a first aspect, the present invention provides a screen panel module for a screening apparatus, the screen panel module being characterised in that it includes two side portions which extend longitudinally of the module, each side portion having

(a) a longitudinally extending recess,

15 (b) a longitudinally extending retaining member located inwardly of the recess,

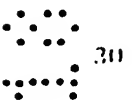
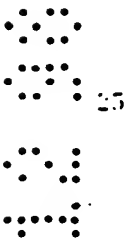
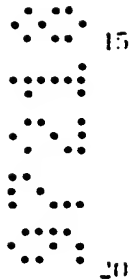
20 (c) a longitudinally extending skirt, defining an outer edge of the recess, and

(d) a longitudinally extending groove projecting from the recess in a direction normal to the recess,

25 each side portion being arranged to support the module on a supporting member, the recess and groove of each side portion defining a cavity for clipping engagement with a protrusion of the supporting member, when installed in a screening assembly, to facilitate the retention of the module in position with the two side portions supported on and secured to respective supporting members.

30 According to a second aspect, the present invention provides a screen assembly including:

a plurality of elongated support rails which are generally parallel, co-extensive and transversely spaced with respect to each other, at least one of



the rails having a pair of longitudinally extending protrusions which are transversely spaced with respect to each other.

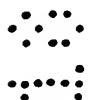
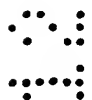
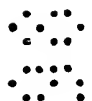
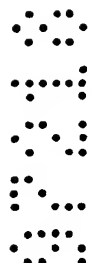
a plurality of screen panel modules to be mounted on the rails in side-by-side abutting relationship, each module having side portions which extend longitudinally of adjacent rails so as to be supported thereby, each side portion having a longitudinally extending recess and a longitudinally extending reinforcing member located inwardly of the recess, a longitudinally extending skirt located outwardly of the recess, and a longitudinally extending groove projecting from the recess in a direction normal to the recess; and wherein each protrusion has a transverse cross-section complimentary to its associated recess and groove and is positioned securely therein so as to be engaged between opposing parts of the recess and groove of its associated module, with respective side portions supported on respective adjacent support rails.

According to a third aspect, the present invention provides an elongated rail member for a screening apparatus of the type including a plurality of elongated support bars which are generally parallel and transversely spaced with respect to each other, and a plurality of screen panel modules mounted on said elongated rail members in side-by-side abutting relationship, each elongated rail member being characterized in that it has a longitudinally extending protrusion located inwardly of a respective edge of the rail member to form a module supporting shoulder between the protrusion and the edge of the rail member, the protrusion having a transverse cross-section complimentary to a recess in a side portion of the associated screen panel, and arranged to be positioned securely therein so as to be engaged between opposing parts defining the recess of the respective associated module.

Preferably, each side portion of each module includes a longitudinally extending shoulder defined by an inner edge of the respective recess whereby each shoulder is supported on the respective adjacent support rail.

Preferably also, the adjacent skirts of adjacent modules cooperate to aid in retaining the modules in position secured to the rails, by resisting outward movement of the respective adjacent skirts.

Preferably also, each protrusion of each rail is provided with spaced cut-outs and each panel has a portion arranged to cooperate with a



corresponding one of the cut-outs to restrain the module against longitudinal movement.

In particular embodiments of the invention, each module is provided with one or more transverse reinforcing bars

5 The protrusions of each rail preferably snap engage within the recesses of the respective panels, and the grooves of adjacent panels project towards each other transversely of the rail.

10 In the preferred embodiment, the protrusions on the rails have a lip at their extremity which is received within the groove to provide the snap engagement. The recesses of each module preferably have a minimum transverse width which is less than the maximum transverse width of the protrusions at their lip so that the protrusions snap engage within the associated recesses.

15 The rails are preferably adapted to be secured to support bars and are typically mounted onto bars forming part of a subframe.

The modules are preferably molded from resilient plastics material and the rails are also molded from resilient plastics material to facilitate resilient deformation of the modules and the rails during assembly of the modules on the rails.

Brief Description of the Drawings

A preferred form of the present invention will now be described by way of example with reference to the accompanying drawings, wherein Fig. 1 is a schematic

Fig. 2 is an exploded schematic sectional end view of a central support rail and an edge of a screen panel, and

Fig. 3 is a schematic sectional end view of a support member supporting the rail of Fig. 2 and abutting edge of adjacent screen panels.

Detailed Description of Preferred Embodiments

In the accompanying drawing, there is schematically depicted the general arrangement of a screening system embodying the present invention, including a plurality of screen modules 1 supported by support assembly 2. The support assembly 2 includes a plurality of support bars 3 which are arranged to support and engage at least a portion of the periphery 4 of the modules 1.

25 The modules may be clamped into position with respect to bars 3. The operation of the optional clamping arrangement 5 is described in the applicant's Australian Patent Application No. 27046/88. Basically, wedge

means 11 drive member 10 downwardly onto support bars 3 to firmly secure screen module 1 in place.

Onto support bars 3 are mounted rail members 6 and 6'. Rail member 6 is a central rail adapted to support in side-by-side abutting relationship adjacent screen modules 1. Rail member 6' is a side rail being essentially equivalent to one half of rail member 6.

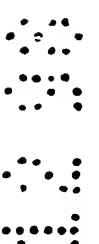
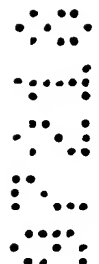
Cut-outs 17 are provided in rail member 6 to provide means by which movement in directions B and C of panels 1 is prevented.

Rail members 6 may be fastened to support bars 3 by means of bolt 7 as shown in Fig. 3. Bolts 7 are located at various longitudinal locations along track 6. The rail members 6 and 6' are preferably manufactured from a resilient plastics material and may include a longitudinally extending reinforcing member 19.

Referring to Fig. 2, rail members 6 and 6' are provided with a pair of steps 21 and a pair of protrusions 12 arranged to mate with recesses 14 in the edge 4 of the screen module 1. Additionally, protrusion 12 is provided with a lip 13 designed to engage with groove 15 in edge 4 of module 1 thus providing means by which module 1 is held firmly in place by track 6. As best seen in Figure 2, the recess 14 and groove 15 cooperate to provide a neck 17. The width of the neck 17 is narrower than the effective width of the protrusion 12 at the lip 13. Accordingly as described above the lip 13 snap engages within the groove 15 after passing through the neck 17. The edge of the module is also provided with a second shoulder which is arranged to sit on the support bar 3.

The screen module 1 is formed of plastic material such as polyurethane and in a preferred embodiment may be reinforced with reinforcing bars 16 extending longitudinally therein. Transversely oriented reinforcing bars are also preferably provided.

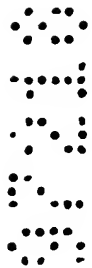
In use, screen modules 1 are individually snapped onto tracks 6 and 6' by application of a force in the direction of arrow A. As a plurality of screen modules 1 replace much larger conventional unitary screen members this process is much easier and safer than otherwise possible. Once one screen module 1 is in place, further screen modules 1 are similarly snapped into tracks 6 and 6' to abut with the screen module 1 previously put in place and any adjacent screen modules 1. Accordingly each panel has a skirt portion



18 located between the protrusions 12 to aid in securing the modules 1 to the rail members 6.

5 It should be noted that minor changes are envisaged by the applicant. For example the specific shape of tracks 6 and the means by which the tracks 6 are anchored to support bars 3 may be altered without departing from the scope of the invention.

10 It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A screen panel module for a screening apparatus, the screen panel module being characterised in that it includes two side portions which extend longitudinally of the module, each side portion having:

- 5 (a) a longitudinally extending recess;
 (b) a longitudinally extending reinforcing member located inwardly of the recess;
 (c) a longitudinally extending skirt, defining an outer edge of the recess; and
 10 (d) a longitudinally extending groove projecting from the recess in a direction normal to the recess.

each side portion being arranged to support the module on a supporting member, the recess and groove of each side portion defining a cavity for clipping engagement with a protrusion of the supporting member, when installed in a screening assembly, to facilitate the retention of the module in position with the two side portions supported on and secured to respective supporting members.

2. The screen panel module as claimed in claim 1, wherein the module is formed of a resilient plastics material to facilitate resilient deformation of the modules when attached to the supporting members.

3. The screen panel module as claimed in claim 1 or 2, substantially as hereinbefore described with reference to the accompanying drawings.

Dated this eighteenth day of December 1993

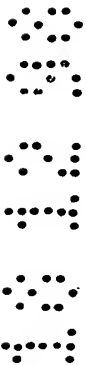
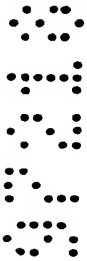
USF JOHNSON SCREENS PTY LTD
 Patent Attorneys for the Applicant:

F B RICE & CO

ABSTRACT

A screening system is provided including a plurality of screen modules 1 supported by support assembly 2. The support assembly 2 includes a plurality of support bars 3 which are arranged to engage at least a portion of the periphery 4 of the modules 1.

Onto support bars 3 are mounted rail members 6 and 6'. Rail member 6 is a central rail adapted to support in side-by-side abutting relationship adjacent screen modules 1. Rail members 6 are provided with protrusions 12 being designed to mate with recesses 14 in the side 4 of the screen module 1. Additionally, protrusion 12 is provided with a lip 13 designed to engage with groove 15 in edge 4 of module 1 thus providing means by which module 1 is held firmly in place by track 6. The recess 14 and groove 15 cooperate to provide a neck 17. The width of the neck 17 is narrower than the effective width of the protrusion 12 at the lip 13. Accordingly, as described above the lip 13 snap engages within the groove 15 after passing through the neck 17.



1/2.



FIG. 2

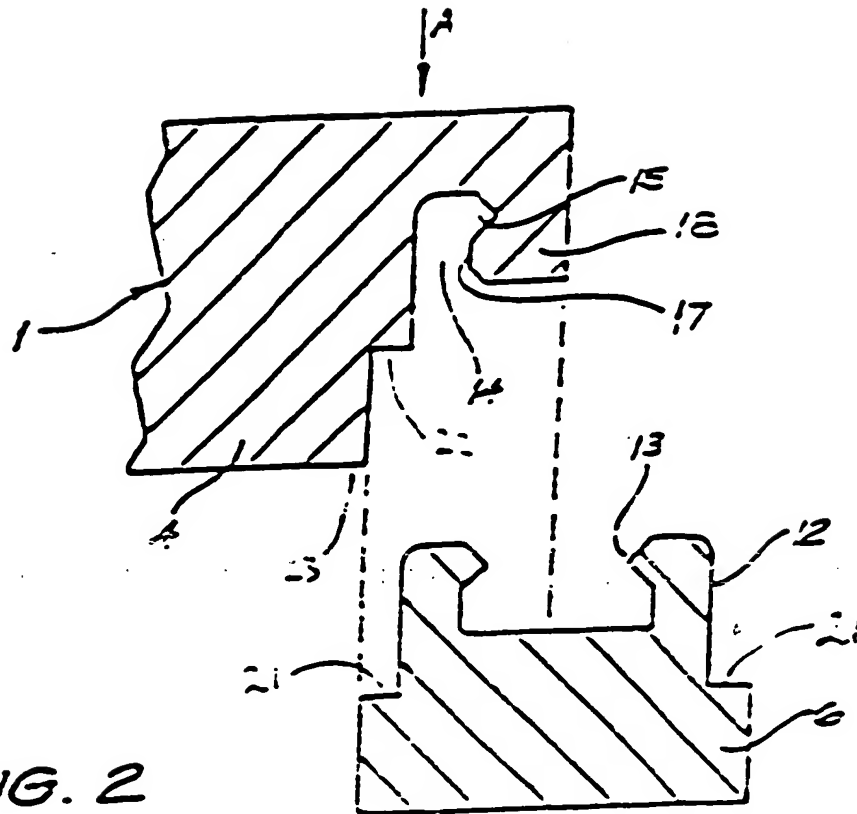


FIG. 3

